

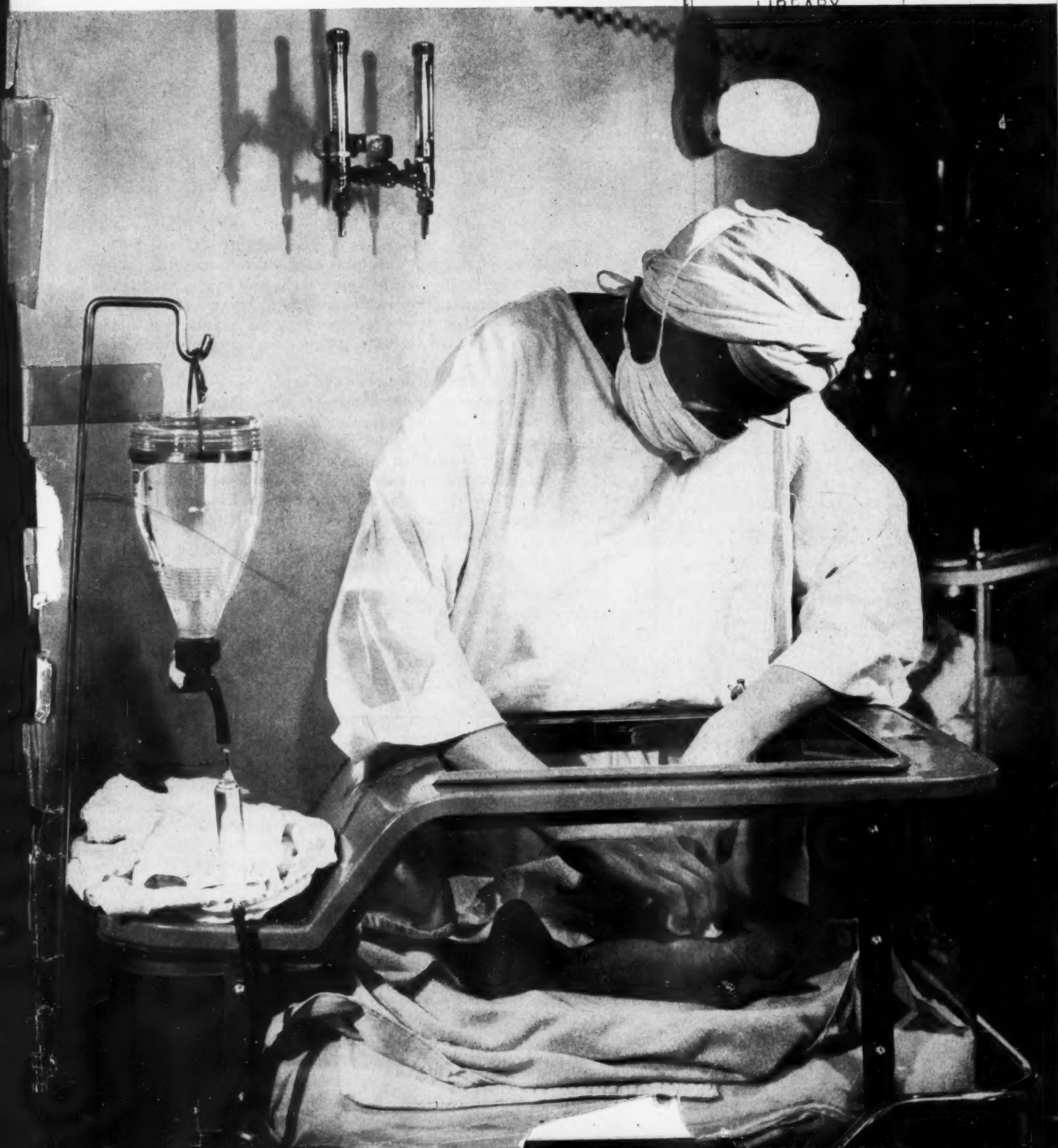
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# PREMATURE BIRTH IS A PUBLIC-HEALTH PROBLEM

ARTHUR J. LESSER, M. D., *Chief, Program Planning Branch, Division of Health Services, Children's Bureau*

**WE KNOW** comparatively little about premature birth as a national problem. We do not know how many babies are born prematurely each year in the United States, because prematurity is measured by birth weight and until recently few States had an item on the birth certificate asking for the baby's birth weight. Our principal sources of information at present on prematurity are the death certificates that give premature birth as the cause of the baby's death, plus a few State, city, and hospital studies.

It is obvious that if we are to have comparable reporting on premature birth throughout this country there must be Nation-wide agreement on just what premature birth is. But no agreement on definition has been achieved as yet.

Some years ago the Bureau of the Census, the Children's Bureau, and the American Public Health Association agreed to define premature birth as "the termination of pregnancy in the period from the beginning of the 28th to the end of the 37th week of gestation." But this definition has become generally discarded. There is more widespread acceptance and use, with some reservations, of the definition recommended by the American Academy of Pediatrics: "A premature infant is one who weighs 2,500 grams or less at birth (not at admission) regardless of the period of gestation. All live-born premature infants should be included, evidence of life being heart beating or breathing."

As used, this definition is often modified to read "one who weighs less than 2,500 grams," excluding babies who weigh exactly 2,500. Although weight is accepted as a more objective and more readily measured criterion of prematurity than length of gestation, some hospitals set a minimum weight as well

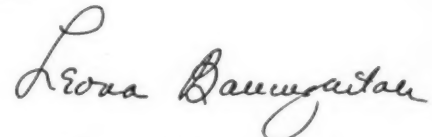
**PREMATURITY** is our biggest challenge today in saving the lives of babies.

Many thousands of the prematurely born infants who now die each year could be saved to grow up as normal, healthy children.

Thanks to the pioneering work that some doctors and nurses are doing, we are developing much experience in how to give the highly skilled care that premature babies must have because they cannot breathe, swallow, or maintain body temperature as full-term babies can. We are beginning to learn, too, more about preventing premature labor.

The double task ahead of us now is to apply this experience more generally and to increase our knowledge through new research in order to learn new ways of preventing death.

This issue of *THE CHILD*, which is devoted entirely to the problem of prematurity, is too limited in space to touch on all aspects of the subject. But if the papers published here, which present the observations of some workers who have given special attention to this problem, stimulate a broader interest in this battle for life, they will have served their purpose.



LEONA BAUMGARTNER, M. D.  
*Associate Chief, Children's Bureau*

as a maximum in defining a premature. This is because babies weighing less than 1,000 grams rarely survive. One large hospital, in addition to setting a minimum weight, modifies the definition of evidence of life to require breathing, on the ground that heart-beat alone is not sufficient evidence of life. Individual physicians often also try to judge whether an infant is viable, a rather broad term that refers not only to weight and signs of life but to other rather vague general considerations as well.

Such variations in definition will continue to hamper our collection of information regarding prematurity until

they are resolved, probably through the work of a nationally accepted committee. Currently, the Children's Bureau defines a prematurely born infant according to the definition of the International Statistical Classification of Diseases, Injuries and Causes of Death: "A premature infant is a live-born infant with a birth weight of 5½ pounds (2,500 grams) or less \* \* \*." If reporting is to be effective it must be simple and objective, eliminating as far as possible any judgmental factors.

In the absence of Nation-wide reporting of prematurity it is not possible to say how many babies are born prematurely each year in the United States.



As the premature baby grows older he should gradually become more and more like a full-term baby. Though small, he should have good color, his muscles should be firm, and he should gradually become active and alert. If he is protected from infection and gets the proper feeding and care he will catch up with the normal full-term baby, as a rule by the time he has reached the age of 4 years.

The figure usually accepted, 5 percent of the live births, is based on several studies, including those made by the New York City Department of Health and the Children's Bureau. Wherever the studies include a large proportion of Negro infants a higher incidence of prematurity is reported, for Negroes are more apt to have a low birth weight than whites.

#### Incidence of premature birth varies

Enough studies have been made to caution us in the use of the 5-percent figure in planning programs for the care of premature infants, for the factors which affect the incidence of premature birth vary from community to community. The incidence at the Johns Hopkins Hospital during a 20-year period was reported to be 11.7 percent. At the Denver (Colo.) General Hospital, 20 percent of the babies born in the 3-year period beginning July 1, 1946, alive were reported as born prematurely, and at the Colorado General Hospital, during the same period, the incidence was 12 percent.

Now that almost all the States include birth weight on the birth certificate, in a few years it will be possible to have some national and State data on the incidence of premature birth.

The greater a premature baby's birth weight, the better are his chances of surviving. Therefore for any study of premature babies, it is essential to know how their weights are distributed. Table 1 gives this distribution in a

group of 12,813 premature births in New York City in 1948.

This table is of interest because it is based on a large number of premature infants. We cannot, however, expect the distribution of weights in a hospital center that is part of a State health department's premature-infant program to be the same as this one. This is because such centers frequently receive a higher proportion of small babies than do hospital nurseries, which draw almost entirely on their own obstetric departments and admit few babies born outside the hospital.

**TABLE 1.—Number and percentage of premature infants by birth weight groups, New York City, 1948**

	Number	Percent
Total.....	12, 813	100. 0
Less than 1,000 grams.....	563	4. 4
1,000-1,499 grams.....	816	6. 4
1,500-1,999 grams.....	2, 231	17. 4
2,000-2,499 grams.....	9, 203	71. 8

For example, in the premature-infant center of the Herbert J. Thomas Memorial Hospital in South Charleston, W. Va., which serves Charleston and Kanawha County, only 7 percent of the 145 prematures admitted in the first year of operation were in the favorable group—2,001 to 2,500 grams—compared with 71.8 percent in the 2,000- to 2,499-gram group in New York City in 1948. Thirty-eight and one-half percent of the prematures at this center

weighed 1,500 grams or less, as compared with 10.8 percent for the similar weight group in New York City in 1948. In another small group, of 441 prematures studied in 4 hospital centers of the North Carolina program, 33.3 percent of the infants weighed 1,500 grams or less.

It is true that the number of infants in these two State programs is small, but the fact that the proportion of small babies admitted to these centers was so much higher than the expected incidence has considerable significance in planning programs.

When we look at the factors influencing the incidence of prematurity, we need to emphasize not only specific conditions associated with premature birth, particularly abnormalities of pregnancy, but also inadequate prenatal care. It is undoubtedly significant that about half of the mothers delivered at the Denver General Hospital in 1948 had had no prenatal care, inasmuch as a fifth of these mothers were delivered of infants who weighed less than 2,500 grams at birth. Eastman found that premature birth occurred in 24.9 percent of his patients who had poor prenatal care, or none, as compared with 7.8 percent of those who had good care. The social conditions under which the pregnant woman lives, the stresses and strains in her home situation and their effect on her nutrition, and the availability and utilization of good medical care are unquestionably major factors in the incidence of premature birth.



Of particular interest is the large proportion of premature births—about 60 percent according to a study by Eastman (American Practitioner, March 1947)—to which it was not possible to assign a specific cause. Further study is needed of such births if preventive measures are to make an appreciable reduction in the incidence of prematurity. To quote Eastman: "If this be true, in about 60 percent of all premature births, no specific explanation for the accident can be educed. What can be the cause of the early onset of labor in these cases? In all medicine there is surely no more important problem than this, since it entails a threat to the lives of some 150,000 babies annually in this country alone."

Studies have been made of deaths of premature babies in several hospitals that have special facilities for prematures. Such hospital statistics should not be compared with one another in order to measure quality of care, inasmuch as the hospitals use various definitions of prematurity and serve different segments of the population.

We need a standardized method of studying deaths of premature babies in hospitals. Such standardization will greatly help in getting more accurate statistics on a more uniform basis.

#### Premature baby born in hospital has better chance

The supplement to the Report of the Academy of Pediatrics on Child Health Services and Pediatric Education contains data on the deaths among premature infants in 323 hospitals, with separate figures for those born within the hospitals and those born elsewhere. Of particular significance is the high percentage of deaths—36.6 percent—among premature infants born elsewhere and admitted to the hospitals, as compared with 21.5 percent among infants born in the hospitals. Recently, several State and local health departments and hospitals having premature-infant centers have made mortality studies. Such a study at the Colorado General Hospital, of 205 infants, revealed that among 104 premature infants born in the hospital, only 9.6 percent died; but among 101 infants born outside and admitted to the hospital 28.7 percent died. The babies born elsewhere and admitted to the hospital showed a heavy concentration in the lower-weight groups. Only 19 per-

cent of them were in the favorable weight groups—2,000 to 2,499 grams weight—as compared with 65 percent of the infants born in the hospital. (Program Review, prepared by Denver Regional Staff, Children's Bureau, March 15, 1950.)

Among 145 premature infants in the Herbert J. Thomas Memorial Hospital,

operation long enough to report on larger numbers.

Information on a State-wide basis will become available when more States are able to match birth and death certificates to study mortality among premature infants. New York State figures are a good example of such data since that State has had birth weight reported

TABLE 2.—Deaths under 1 month of age among infants born in New York State (exclusive of New York City) by weight at birth, 1946

Birth weight	Total live births	Deaths under 1 month	Rate per 1,000 live births
Total.....	134, 266	3, 116	23. 2
2,500 grams and over.....	113, 561	903	8. 0
Less than 2,500 grams.....	8, 470	1, 666	196. 7
Under 1,500 grams.....	1, 245	945	759. 0
1,500-1,749 grams.....	622	201	323. 2
1,750-1,999 grams.....	989	180	182. 0
2,000-2,249 grams.....	1, 943	189	97. 3
2,250-2,499 grams.....	3, 671	151	41. 1
Not stated.....	12, 235	547	44. 7
Premature gestation.....	883	341	386. 2
Others.....	11, 352	206	18. 1

From: "Public Health in New York State: 1946, Vital Statistics" Annual Report of the Office of Vital Statistics for the year 1946, New York State, July 30, 1948.

South Charleston, W. Va., 34.5 percent died—a seemingly high fatality rate. However, more than three-fourths of the infants were born outside the hospital and more than one-fourth of them were born at home. We have referred previously to the high proportion of small babies among the West Virginia prematures. When the figures are examined by weight groups, this center has an excellent record for survival of infants.

The fatality rate for 441 premature infants admitted to the North Carolina program was 12.7 percent.

Statistics such as the foregoing ones from premature-baby centers are among the best we have. What is new about some of these data is the inclusion of large proportions of infants born outside and admitted to the center. This is typical of the premature-baby centers that are operating in cooperation with State and local health departments. It introduces a factor present to only a small degree, or not at all, in most previous studies of hospitals, in which as a rule the premature infants were born in the hospital. The numbers of infants in the State programs are still small, since few such centers have been in

on its birth certificates for the past 10 years. The data for 1946 are included in table 2. Note that nearly 10 percent of the certificates gave no birth weight. Note also that the neonatal mortality rate in the most favored group—2,000 to 2,499 grams—was 61 deaths per 1,000 live births, or almost eight times the neonatal mortality rate for infants weighing 2,500 grams or more, indicating that even this group is in need of special attention.

#### Larger prematures more likely to survive

That weight at birth, which is an expression of the degree of prematurity, is the most important inherent factor in the survival of premature infants is well shown in table 2, and these figures are typical of all such reports. Most of the infants in the lowest-weight group die during the first day of life. The key to this difficult situation is to prevent premature labor insofar as possible, so as to enable the infant to reach a more favorable weight, and to provide delivery care for the mothers that is in keeping with the special problems of these infants.

(Race is generally believed to be a factor in mortality from premature

birth because Negro infants are apt to weigh less than white infants. Similarly, plurality of births is a factor because infants so born are smaller than the usual single-born infant. It is clear that birth weight is the fundamental factor in the baby's chance to live.)

Only recently Taylor (*The Mother*, October 1948) has presented evidence that complications of pregnancy have a direct effect on mortality among premature infants. Studies done at Colorado General Hospital indicate that there is a much higher mortality among premature infants born of mothers who have had complications than among infants of the same weight groups whose mothers have not had such complications. The type of anesthesia used in delivery is also a factor in the survival of premature infants; one hospital found that considerably more premature infants survive when conduction anesthesia is used (such as caudal or saddle-block) than when other anesthesia (such as inhalation of ether or nitrous oxide) is employed.

Place of birth is too little recognized as a most important factor. We have already referred to information from the Colorado and West Virginia programs regarding this. Not only are a larger proportion of the smaller infants referred to the special centers, but infants are often kept at their place of birth for several days and referred to the center when they no longer appear to be doing well.

Of course, people in unfavorable economic circumstances undergo greater health hazards in general than do other people. But when a premature baby is born into a family without good economic resources, the parents will be unable to pay for the special hospital care such a baby needs, and he may go home with the mother from the hospital whether or not he is developed sufficiently to be well taken care of at home. Or, if the mother is delivered at home, the baby may not receive hospital care at all unless a public program is in operation.

Since premature infants are usually discharged when they weigh about 2,500 grams, they are still small and must have good care if the services they have received at the premature-baby center are not to be nullified by poor care after discharge. The health - department

staff, particularly the public-health nurse and the medical social consultant each plays an important role.

Although all the factors we have been discussing are important in the survival of premature babies, after birth the major factor, of course, is the quality of the care he is given.

When home conditions are unsatisfactory the medical social consultant may work with other community agencies in securing needed help in improving the situation, or plans for foster-home care may have to be made.

**Training of nurses and physicians in the care of premature infants.**

**Development of hospital standards and licensing, with emphasis on facilities and personnel for proper care of premature infants.**

**Consultation to hospitals (principally by nursing consultants) to raise the standards of care for full-term as well as premature infants.**

**Loan of incubators, together with consultation regarding their use.**

**Provision of transportation of premature infants to premature-infant centers.**

**Development of designated premature-infant centers and purchase of hospital care for them.**



One feature of a comprehensive State or local program for saving the lives of premature babies is safe and rapid transportation of the baby from his place of birth to the hospital.

Now let us ask: What is being done to meet the problem of premature birth?

Though State and local health departments are proceeding in various ways in their efforts to save premature babies, a basic pattern is evident. Since the term "program" is used in various ways by the States, it might be well at this point to list the types of activities related to premature infants that State health departments are carrying out. These important activities are:

**Measures designed to prevent prematurity, such as—**

**Extension of prenatal services, with emphasis on diagnostic services and the importance of adequate nutrition.**

**Obstetric consultation for complications during pregnancy.**

**Hospitalization for complicated pregnancy.**

**Obstetric consultation to improve management of the mother's labor and delivery in cases of premature birth (since most of the premature-infant deaths occur on the first day of life).**

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# WHEN A PREMATURE BABY IS BORN

**HENRIETTA MARQUIS, M. D.,** *Acting Director, Division of Maternal and Child Health, West Virginia State Department of Health, Charleston*

When a premature baby is born, whether at home, in a small hospital without adequate facilities, or in a large hospital that has a standard unit for premature babies, he will need specialized care. Let us concentrate on the elements that should be available to insure this baby's survival.

The premature birth of a baby is a medical emergency. Every midwife and physician should be educated for the emergency and know how and where to obtain help and action. Whenever possible preparations should be made for the baby before he is delivered. Suppose he is born in a rural home and no neighboring hospital has facilities for his care. The State health department, through its division of maternal and child health, should have planned with the county health department so that upon notification to that department a specially trained public-health nurse will be sent to the home as quickly as possible. Equipment for premature infants should also be made available and, if possible, a pediatric consultant. The mother should be carefully instructed about how to care for her baby and about the need for medical and nursing supervision.

If the baby is born in a rural or an inadequately equipped hospital, in an area that has no premature center, the health department can be called upon for the same type of service. Incubators can be lent, pediatric consultants can be used when necessary, and the public-health nurse can investigate the home and instruct the mother before the baby is discharged from the hospital. The baby should not leave the hospital until arrangements for his care at home meet certain standards. After

the baby's discharge the public-health nurse should make further visits until the baby is well on the road to survival and can be referred for follow-up to a well-baby conference, if the family has no access to private medical care.

Let us suppose a premature baby is born, either at home or in the hospital, in an area that has a premature-infant nursery. The physician or midwife immediately notifies the proper authorities who arrange for transportation to the center. Many localities have a special ambulance or automobile equipped with a portable incubator that carries a small oxygen tank. In West Virginia our nurse is picked up by the ambulance. While in transit she heats her incubator and then carries it to the baby. She dresses the baby in a packet of sterile clothing that she brings with her. The oxygen is turned on, and the baby is placed in the incubator and carried into the ambulance. The car is driven to the center with its siren sounding.

While in transit our nurse has on hand material to cope with emergencies. When the nurse and baby arrive at the premature center, the baby is transferred from the portable incubator to an incubator that has already been heated and filled with oxygen.

What constitutes a center for premature babies? Space is allotted in the hospital separate from the nursery for the full-term babies. The set-up does not have to be elaborate. One of the best premature nurseries is that under the supervision of Miss Lundeen at the Michael Reese Hospital in Chicago. I remember my amazement as I viewed its simplicity the first time I saw it.

Centers for premature babies base their procedures and practice on four principles formulated to meet the physiologic handicaps with which all premature babies are born: (1) Competent nursing care with the least pos-

sible handling; (2) preservation of normal body temperature; (3) prevention of infection; and (4) adequate nutrition.

Dr. Myron E. Wegman has said: "Constant and competent nursing care means loving attention in the truest sense of the word." For each full-term infant, 2 hours of nursing care are required every 24 hours; but 6 hours are the minimum for a premature infant. There should be one nurse for every four babies per shift. The degree of prematurity affects the amount of care needed: The 1,000-gram baby needs more care than the 2,000-gram baby needs. The premature baby must be watched almost constantly during his first 48 hours. It requires more time to feed him; he may need special treatments; and he must be closely watched for cyanosis and other complications.

All these things take extra time, but more than anything else it is important for the nurse in the nursery for premature babies not to cut corners. She must feel sure that she has enough time to carry out each phase of her job meticulously, without skimping on technique or hurrying a feeding. But however much time is available, it cannot replace intelligence and interest. And neither organized plans nor legal requirements can insure good care when these attributes are lacking.

Much work has been done on establishing minimum standards for maternity homes and for nurseries for newborn babies. Those requirements play an important part in the over-all program, but they cannot do the whole job. There may be incubators and suction apparatus; there may be an adequate schedule for nurses; there may be a fine formula room; but none of these will suffice without real interest and drive. For without them it becomes easy to let the incubator run without

*Condensed from a paper read at an institute on the care of premature infants, held at Meharry Medical College School of Nursing.*



checking its operation; to make the nurse's schedule a farce by calling her out of the nursery for so-called emergency duty elsewhere; to negate the fine equipment in the formula room by understaffing the room to the point where speed-up results in taking unsafe chances.

All nurses who work with premature babies should have special preparation. But if that is impossible, we may demand as a reasonable minimum that the nurse in charge of the nursery has had such preparation and has the authority and ability to train those working under her. The existing shortage of nurses has caused many institutions to use untrained personnel such as nurses' aides and ward maids. If these have aptitude and interest and are trained and supervised carefully they can do excellent work.

The second requirement in the care of premature babies is the preservation of normal body temperature. This calls for some apparatus to prevent wide fluctuations in temperature and to help the infant conserve his own body heat. Therefore the incubator. Standards for incubators that will accomplish these ends have been set up. Some of the approved incubators are relatively low-priced. (Safety devices to protect against mechanical failures are essential.) Besides helping the baby to maintain a stable temperature, the incubator regulates the humidity of the atmosphere and helps in administering adequate oxygen concentrations. An incubator can act as an isolation unit and can protect the baby from infection.

Fine incubators, however, cannot take the place of intelligence or interest in nursing care, and by the same token a premature program based on the purchase of an incubator without properly planning for its use is likely to be futile.

Thirdly, whether the baby is at home or in a hospital, he should be completely segregated from everyone except the person caring for him. Admission to the premature room or unit must be limited for doctors as well as anyone else. Usually it is possible, except in institutions caring for only one or two premature infants, to insist upon completely separate nursing personnel. It is far more difficult to have a separate staff of physicians, but this objective should be kept in mind when schedules for staff



Besides helping the premature baby to maintain a stable temperature, an incubator regulates the humidity of the atmosphere and helps in administering adequate oxygen concentrations.

members are made. It is best to have one pediatrician in charge of the unit, and if that is impracticable, to set up a rotating service of not less than 3 months for each physician.

The use of gowns in premature units is less important from the standpoint of physical coverage than as a reminder to observe scrupulous technique.

Hand-washing facilities must be placed so strategically that the staff is constantly reminded of their use.

Face masks as commonly used have more disadvantages than advantages. Although they may prevent infection effectively part of the time, this advantage is offset when a worker with a cold is tempted to go into the nursery under the mistaken impression that the mask will protect the babies. Touching the mask with the hands or wearing it long will defeat its purpose.

Another useless procedure is the routine nose-and-throat culture for personnel. It gives a false sense of security. Nose-and-throat cultures cannot detect viruses, and at best they can reveal the presence or absence of streptococci or pneumococci only at the time of taking the culture. While the culture is being read, the state of the nose and throat may become completely different. Reliance is much better placed on questioning and inspecting personnel and on permitting no one with any sort of illness to enter the premature unit. This is perhaps the most difficult of all the rules to enforce. Low-salaried workers are loath to lose pay for a day off duty. Better personnel practice is to assign those who have minor colds to duty elsewhere in the hospital. This will en-

courage the prompt reporting of illness.

The premature baby's laundry must be done separately from other hospital laundry. Each baby should have his own supplies, and everything should be done for him in his own personal unit.

The fourth principle concerns nutrition. Some pediatricians believe that breast milk is the best food for premature babies, although others have evidence that partly skimmed milk with added carbohydrates is the feeding of choice. In Dr. Hess' clinic at the Michael Reese Hospital, breast milk only is used. Dr. Gordon of Denver and Dr. Levine of New York believe that partly skimmed cow's milk gives the best results. Dr. Powers of New Haven also prefers to use this type of milk rather than breast milk. The precise type of food used is important up to a point, but equally important is the preparation of the milk and the attention paid to the baby while he is being fed. It is frequently necessary to feed these babies by gavage. Needless to say, only experienced, well-trained nurses should be permitted to carry out such a procedure.

There is no point in expending energy and funds to save the life of a prematurely born baby only to have him discharged from the hospital to go to a home where his parents cannot look after him properly. About a week after the baby is admitted to the premature center, a report should be sent to the public-health nurse. She visits the baby's home. She wins the confidence of the parents and explains the details involved in the care of the baby. She

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# SOME FACETS OF THE COLORADO PREMATURE-INFANT PROGRAM

**HARRY H. GORDON, M. D.,** *Department of Pediatrics, University of Colorado Medical School, Denver.*

**F**OR the past 2 years Colorado has had a premature-infant program as a joint responsibility of its State health department and State university. We wish to discuss with you some of our experiences, and to stress that an effective program must have many facets besides good nursery care.

Some years ago, Dr. Roy Cleere, executive director of the Colorado State Health Department, and Mrs. Vesta Bowden, then nursing consultant for its Division of Maternal and Child Health, collected data on neonatal mortality in Colorado. Our rate for deaths due to prematurity was worse than those of the neighboring States of Kansas and Nebraska, better than that of New Mexico. As was to be expected, we, too, had a problem.

## **Agree on need for premature-baby center**

In late 1946, in consultation with representatives of the Children's Bureau, the division of maternal and child health called a conference of representative nurses, social workers, practicing pediatricians, obstetricians, and general practitioners, and members of the faculty of the State university medical school. The practicing physicians agreed on the need for a premature center to which infants requiring special care could be referred. They were concerned lest a program be developed in which transfer of all infants to this center would be compulsory. Reassurance on this point was given, and the State medical society gave approval, with a caution on the dangers of the use of Federal funds. A plan and agreement were drawn up for approval by the State health department and the board of regents of the university, outlining the aims of the program, the di-

vision of responsibilities, the methods for payment and for review of progress.

In the discussions which followed, it was agreed by representatives of the State health department, the Children's Bureau, and the university that any premature center which was established at the Colorado General Hospital, the university teaching hospital in Denver, must have as primary aims not only service to patients, but also instruction of personnel. Furthermore, the high cost of care of these infants, the limited funds and personnel, indicated the need for a comprehensive program aimed at prevention or mitigation of the degree of prematurity and at follow-up care which might decrease the duration of initial hospitalization and prevent readmissions. This, in turn, required visiting-nurse, social, and nutrition services, as well as provision of medical and hospital care.

## **Many professions represented**

Since the program called for participation of large numbers of people—medical, nursing, social-service, and nutritionist representation from the divisions of maternal and child health of the health departments of both Colorado and Denver, representatives of the divisions of public-health nursing of Colorado, Denver, and the tri-county area surrounding Denver, members of the faculty of the school of nursing of the University of Colorado, nurses, social workers, obstetricians, and pediatricians from the university hospital—a monthly conference of these representatives was arranged. This is now

An address given before the Association of State and Territorial Health Officers, at Washington, D. C.

held under the chairmanship of Dr. John A. Lichty, associate professor of pediatrics and pediatric consultant to the State health department, and permits reports of progress, review of procedures, and airing of grievances. More intimate, personal conferences permit ventilation of more intimate personal misunderstandings. During the past few months the staff of the Denver Regional Office of the Children's Bureau have reviewed the charts of 205 admissions to the premature center for the year beginning July 1, 1948. We hope to obtain from their final report much advice concerning improvements; they have been kind enough to furnish us some preliminary data which will be cited later.

## **Incidence of premature birth high**

It has been known for many years that the mortality rates in prematurely born infants vary inversely with their birth weights, i. e., the more mature the baby, the greater his chance of survival. Dr. E. Stewart Taylor, our professor of obstetrics and gynecology, reviewed the incidence of premature births at the Colorado and Denver General Hospitals, two services for which the university is responsible. He found that infants weighing less than 2,500 grams comprised approximately 20 percent of all live births at the Denver General Hospital, a hospital for the indigent of Denver, and 12 percent at the Colorado General Hospital, a hospital for the indigent of the State, as compared with the 5 percent to 7 percent reported by Dr. Baumgartner for New York City, and Dr. Bain for numerous hospitals throughout the country. Furthermore, some 40 percent to 60 percent of the mothers delivered in the Denver Gen-



eral Hospital had had no antenatal care. These results were reported to Dr. Ruth Raatama, Director of Maternal and Child Health for Denver, and she is trying to develop a program for decentralized antenatal clinics in the city and county of Denver.

The Colorado State Health Department is already compiling data on incidence of premature births from the new certificates, which include birth weights. From these one will be able to determine the areas in Colorado in greatest need of help. And what is needed? Not only a premature center, but strong local public-health units. The nutritionist helping the mother to obtain an adequate diet during her pregnancy; the social worker, helping to obtain hospitalization or housekeeping aid where the pregnancy is complicated; the visiting nurse finding the pregnant woman who is getting no antenatal care, and giving her help not only as a nurse, but also as a nutritionist, social worker, and physician, in areas where such professional help is not available; and the general practitioner, backed up by an obstetrical consultant when needed, all may help in keeping smaller infants in utero until they are closer to term.

#### For good management of premature labor

The majority of deaths of prematurely born infants occur on the first day of life. This again is not so much a problem of highly specialized nursery after-care, but rather of delivery-room procedures. We have distributed to all the doctors of Colorado a set of simple instructions, prepared by Dr. Taylor, for the management of premature labor. Our problem is one of professional instruction, and of trying to assure that personnel and facilities for resuscitation will be available at premature labors. Our State health department should be able, shortly after the close of the year, to match birth certificates with death certificates and call to the attention of individual hospital administrators and medical boards, their performances in comparison with the obstetric divisions of other hospitals. Local pride should serve as a resource for decreasing mortality. The mortality rate for 288 infants weighing less than 2.5 kilograms at birth in the Colorado General Hospital during a period of 3 years beginning July 1, 1946, was

12.9 percent. For 273 infants whose birth weight was between 1.0 and 2.5 kilograms, the mortality rate was 8.8 percent.

I will not go into the details of nursery care. Suffice it to say that if nurseries for full-term infants were of higher quality, most prematurely born infants who weigh between 2,000 and 2,500 grams could be given care at the place of birth. The American Academy of Pediatrics has finished its survey of facilities for pediatric care, and there is now available in each State data compiled by the physicians themselves which can serve as a basis for improvement of this care. At least in new hospitals one has a right to expect modern nursery facilities for all newborn infants.

This would then leave only a relatively small number of infants who would require transportation to a special premature center—most of the 30 percent of prematurely born infants who weigh less than 2,000 grams, and that portion of the 70 percent who weigh more than 2,000 grams who are having difficulties. A recent analysis by Dr. Taylor of the effect of complications of pregnancy or labor on the mortality rate in prematurely born infants indicates that in every weight group there is a significantly greater mortality for infants born from abnormal pregnancies or deliveries. For a group of 477 infants born at Colorado

and Denver General Hospitals weighing less than 2,500 grams, the mortality rate was 8 percent for the "normals" and 37 percent for the "abnormals." It has therefore become our practice to consider prompt transfer to the premature center of all infants born prematurely at Denver General Hospital to mothers whose pregnancy or delivery has been abnormal.

The problem of transportation requires that oxygen be available during the period of transport. The Colorado premature center sends an ambulance, a pediatric resident, and an incubator to any place within 35 miles of Denver to pick up babies. The problem of transportation to the 35-mile mark is the responsibility of the referring physician. The Colorado State Health Department has provided incubators, either for care or transportation, at 18 sites.

Since we have only 20 beds in our premature nurseries, you may be interested in the criteria for admission. Infants born in the Colorado General Hospital who weigh between 2,000 and 2,500 grams are admitted to the full-term nurseries rather than to the premature nursery unless they are doing badly. Infants born outside our hospital, weighing less than 2,500 grams, are admitted if in the judgment of the referring physician or public-health nurse, facilities for care at the place of birth are inadequate. There is no

Expert nursing care is only one of the many expensive services that a premature baby needs.



means test, and the Colorado General Hospital submits its bill for care at a fixed per diem of approximately half the hospital per diem directly to the State health department. The State health department may, on the basis of social data, submit a statement of costs to the parents with an offer to accept part or whole payment.

The absence of the means test in the agreement between the health department and the university led to much suspicion by the State medical society. This was only partly mollified by the fact that referrals were put completely in the hands of private physicians, unless the patient had been referred by a public agency. At the end of our first year of operation, a complaint was made to the public-policy committee of the State society that we were interfering with private practice. We submitted data indicating that 174 of our first 175 patients were medically indigent. The one exception was an infant whose birth would have prevented his pediatrician from taking a vacation because of his personal social obligations to the parents. The complaints were thrown out by the public-policy committee, and we have had no further open difficulties. The analysis of the data showed that the private physicians and private hos-

pitals were taking care of many medically indigent people. Young couples who can afford through savings or Blue Cross to arrange for a full-term delivery find themselves wholly unable to pay for the care of a prematurely born infant who may require prolonged hospitalization not covered by Blue Cross. Attempts should be made to have Blue Cross grant coverage everywhere for prematurely born infants.

The Children's Bureau has permitted me to use some of the figures obtained from its analysis of our admissions for the year beginning July 1, 1948.

**Average days and computed cost of hospitalization of 165 infants discharged alive from University of Colorado Premature Center, year beginning July 1, 1948**

Birth-weight group (kgm.)	Number of infants	Hospitalization cost <sup>1</sup>		
		Days average	Average all infants	Highest 25 per cent
1.0-----	2	68	\$1,020	More than \$1,000 660 330
1.0-1.5-----	29	55	827	
1.5-2.0-----	53	38	572	
2.0-2.5-----	81	13	199	

<sup>1</sup> Computed at arbitrary per diem of \$15, exclusive of medical services.

The average costs of hospitalization were estimated as varying from an aver-

age of \$199 for a large infant to \$1,020 for a small one. For 25 percent of the infants in the three largest-weight groups, the estimates of cost ranged from more than \$330 to more than \$1,000. Since the per diem was calculated on a modest basis, and excludes medical services, it becomes quite obvious that the debt into which parents may be thrown by a premature birth may constitute one of the greatest handicaps of prematurity.

**Medical social worker helps families**

Needless to say, service by a medical social worker has been of the greatest value to the families of our patients. During the year surveyed 86 percent of the families received an initial exploration of circumstances by either the hospital social worker or the medical social consultant of the Colorado State Health Department to determine whether social and emotional problems existed which would affect the infant's care. Forty-six percent of the families received continued case work either by the hospital social worker, the health-department social-service consultant, or other agencies. We won't stop for details of case histories—in many instances we believe that the social case work meant more to the whole family unit than what had been done for the premature infant whose birth called our attention to the family.

We come now to the problems of follow-up care, and here the public-health nurse again plays a most important role. On admission of every infant to the center, the division of nursing service of the State health department is notified. If the source of original referral is a private physician, the public-health nurse from the local health unit asks the physician to find out from the mother whether she wishes assistance from the nurse in planning for care of the infant. For the year surveyed, on the basis of incomplete returns of referral slips to the hospital, home visits were made in 67 percent of families. The visits of the public-health nurses have been of great help in preparing the home for the premature infant, and in diminishing the mother's anxiety about her ability to care for the infant.

(Continued on page 162)

This baby has been discharged from a premature-baby center in good condition, and a public-health nurse, who, like the nurses at the center, has had special training in methods of caring for such babies, is helping the mother to give the baby the kind of care he needs.



# PREMATURITY IN RELATION TO OBSTETRIC CARE

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Good medical supervision throughout pregnancy is a step toward preventing premature labor.

THE CARE of premature infants involves highly specialized pediatric procedures. Emphasis on these techniques is to be expected when programs to reduce mortality from prematurity are developed. It is possible that the pediatric aspects may receive such prominence that plans for these programs may be made without sufficient consideration being given to the relationship of prematurity to obstetric care.

How often has this remark been made by someone in a premature station: "If they could only give us better specimens to work with." This may be interpreted as a complaint but more often it is a lament. Is the type of obstetric care to be considered a factor in prematurity?

Some conditions related to prematurity encountered during the prenatal period cannot be prevented by obstetric

care, or may be influenced but slightly by such care. Among these are spontaneous rupture of the membranes, twin pregnancy, premature separation of the placenta, certain types of toxemias, habitual premature labor, and other non-preventable situations, such as enforced abdominal operative procedures.

Other conditions involving prematurity may be influenced by obstetric care. Some of these about which something may be done are:

**1. Placenta praevia.**—Earlier diagnosis and observation of these cases in the hospital over a longer waiting period, plus the wide distribution of blood banks, make possible, in many instances, a reduction in the degree of prematurity.

An address given before the Association of State and Territorial Health Officers, at Washington, D. C.

**2. Nutrition.**—Many mass studies have been made of the outcome of pregnancy in relation to diet in women. The People's League of Health of England investigated the effect of nutrition in 5,022 pregnant women. Half of these had supplementary minerals and vitamins with a resultant reduction in the incidence of toxemia and premature births. If a good diet is a safety factor to the mother and prevents any one form of toxemia, that alone is important, since toxemia is one of the major causes of premature births.

In the Toronto Studies of Ebbs, Tisdale, and Scott the incidence of premature births in women with poor diets was found to be 8.0 percent. Among women whose diets were equally poor, but who were supplied with supplementary rations of milk, cheese, oranges, tomatoes, wheat germ, and vitamin D, the incidence of premature birth was



2.2 percent. Burke and associates made a nutrition study of 216 pregnant women from the prenatal clinics of the Boston Lying-In-Hospital. They reported, among other findings, that all the premature babies and all the functionally immature infants of this group were born of mothers whose diets were inadequate. They demonstrated also that the length of the fetus at delivery had a definite relationship to the adequacy of the protein intake of the mother during the prenatal period.

**3. Prenatal care.**—There is an intangible factor associated with adequate prenatal care that contributes toward the well-being of these pregnant women in that they go to term more consistently than those who have poor or no prenatal care. Again the reasons assigned are many. Among these may be instruction, dietary direction, and early detection of complications, always with due credit to the patient who seeks prenatal care regularly. Anderson and others, in a review of 2,514 cases, found that those patients who had inadequate prenatal care were delivered prematurely more often than those who had adequate care. Prenatal care affords an opportunity for early recognition of conditions for which effective treatment may be instituted. Whether the cause of the disease is known does not matter so much if its treatment is effective. It is known that bed rest and sedation may be a help for the hypertensive; salt restriction for the case having edema, and iron or transfusion for the patient in whom it is justified.

**4. Antisyphilitic treatment.**—Premature delivery in syphilitic patients may be reduced by treatment. In a few of these cases, pregnancy may terminate prematurely during the time of treatment. This may be coincidental. With the present penicillin therapy it is not felt that the treatment is a factor in producing labor. As time goes on there should be a continued reduction in premature births in women with syphilis.

**5. Obstetric skill.**—Obstetric skill in handling premature deliveries probably has an effect in preventing intracranial hemorrhage. The delivery of a premature infant by the use of forceps, with an episiotomy, may be preferable to a longer labor against a resistant perineum. Advances in the use of analgesia, anaesthesia, and in the methods of de-

livery may contribute toward giving prematures a still better chance of survival.

**6. Pediatric help.**—There are times when the histories of patients are misleading and the estimation of the size of babies is difficult, but not infrequently an operative or spontaneous delivery of a premature infant is anticipated. When this is true, the pediatrician may be requested to stand by, for a few minutes of his help at this time may save the baby.

Attempts to do something about the prematurity problem in Virginia are being made in association with the obstetric-care program of the State health department. The development of plans directed to the improvement of the care of premature infants was delayed, deliberately, for several years until a program of maternity care was established. This program began with postgraduate institutes in obstetrics for physicians. This was followed by the establishment of prenatal clinics, which led into a method of hospitalizing medically indigent obstetric patients with pathologic conditions. These fundamental obstetric-care activities had a definite bearing on prematurity.

The health-department prenatal clinics, conducted in health centers by local physicians, each year render service to one-tenth of the mothers of the State having babies. This service gives physicians an opportunity to emphasize measures to prevent prematurity. Complications may be discovered and difficulties at time of delivery anticipated. A hospitalization plan gives help that is necessary to meet these situations.

The continued operation of prenatal clinics focused attention, some years ago, upon the urgent need of a method to hospitalize those pregnant women for whom such care was considered imperative. An experimental plan was put into effect in one rural county in 1941 using matched State and Federal funds. Under this plan, hospitalization was made available to medically indigent mothers and babies, referred from official maternal and child-health clinics because of complications. Provision was made later to include the same type of nonclinic patient, referred, as an emergency, through the county health department by the family physician. Premature infants were given

priority in the group of eligibles. Midwife cases requiring hospitalization were screened through the clinics with the approval of the physician in charge.

The experimental plan proved sufficiently successful to justify expansion. For some time, all the State has been included, except the larger cities with independent health departments. Fifty-one participating hospitals are situated geographically so that every section of the State is within reasonable distance of at least one of them. The hospitals are paid by the State health department on the reimbursable per-diem cost basis. No payment is provided for physicians. This plan, like all other maternal and child-health programs in Virginia, represents the combined planning of the health department and medical and allied professions.

This organized plan of hospitalization is believed to be favorably influencing maternal and infant mortality. In addition to providing for prenatal, delivery, and postpartum complications, emphasis is placed on the care of premature infants. An infant born prematurely as a result of a complication of pregnancy has a much better chance of survival if the condition is discovered early, prematurity anticipated, and hospital delivery arranged. Among the many prenatal conditions accepted as a reason for hospitalization under this plan are toxemia, hemorrhage, disproportion, and similar well-defined evidences of pathology. Premature labor without apparent cause is included also as a reason for hospitalization, mainly to give the resulting premature infant a better chance. When twins are diagnosed, authorization for hospital delivery is approved, not only because of the increased incidence of postpartum hemorrhage but also of the possibility of the resulting premature or immature babies having a better chance of survival.

Care of the premature infants under this plan is of value, but of greater importance is the far-reaching effect the program is having in stimulating improvement of premature care in general.

It is probable that increasing attention will be given to the development of programs to reduce mortality from prematurity. Obstetric care, often of importance in its preventive aspects, must be a real part of these programs.

# MEDICAL SOCIAL WORK AND THE PREMATURE BABY

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"I DON'T NEED any help," was the almost defensive comment of the mother of premature twins to the medical social worker who had stopped to see her on the hospital ward. However, as the interview progressed it became apparent that the mother was worried and wished to talk with the social worker. The mother was overwhelmed at the thought of caring properly for two tiny babies, and birth of the twins meant four children in the family under 5 years of age. She was afraid of what the extra responsibility in the home might do to the already strained relations between her and her husband. She doubted her ability to meet additional problems. She wondered if she would have a break-down.

The mother soon realized that she did need help and wanted it, and plans were made for the social worker to visit in the home to assist her. Consultation with a psychiatrist was arranged by the hospital physician because of the mother's concern about herself. Psychiatric treatment was not recommended but the psychiatrist suggested continued social case-work service.

This mother was seen regularly for several months by the medical social worker who helped her gain a measure of personal security, become less anxious about the twins, and work out some of her other difficulties. The mother thought that transportation of the babies to the hospital clinic for medical supervision was an insurmountable obstacle. However, the transportation services of a volunteer agency were obtained so that the babies could be examined regularly. The family situation was discussed with the public-health nurse who was giving nursing supervision in the care of the babies in the home.

The premature birth of a baby may cause a mother unusual anxiety. In the

hospital she sees other mothers with their babies but she cannot see or hold hers. She may question whether her child is perfectly formed or be afraid that she has brought about the prematurity. She may be distressed because she will have to go home without him. She may wonder whether she will know how to care for such a tiny baby. She may be worrying about the cost of the baby's stay in the hospital after she leaves.

Medical social workers taking part in the specialized program for premature babies at the Colorado General Hospital have met these and other problems in the families of babies hospitalized at the center. These are difficulties that might hold back the progress of the baby at home in spite of good medical and nursing supervision. Such problems have been inadequate housing, irregular employment, and insufficient income. Marital difficulties, illegitimacy, health problems in the family (both mental and physical), and parental attitudes toward the baby have also been factors which influenced the type of care the infant received.

Medical social service is an integral part of this center's premature-infant program. The medical social workers help to evaluate whether there are social or emotional problems and give social case-work services when these are needed. The worker attempts to learn something of the mother's feeling toward the baby, family relationships, and the home situation. The policy of admitting infants to the hospital without respect to economic status is explained because this is frequently a source of worry, particularly in relation to the tiny babies who have to remain in the hospital several weeks or months. However, those parents who can afford it are encouraged to make voluntary payments for the service.

The information the medical social worker gathers in talking with the parents or in visiting the home is discussed with the doctors, nurses, and technical members of the staff and is also put into the medical record for their use. The information is especially useful to the doctors in deciding the length of the baby's stay in the hospital. They can decide the time of discharge for each baby on an individual basis, knowing the family and home conditions to which he is going, instead of keeping all babies in the center until they reach a certain weight. If it is possible, no baby is discharged from the hospital without the recommendation of the social worker and the public-health nurse or the one who has visited the home and knows the condition there.

From the start of the program, case-work service from a medical social worker has been made available to the parents of all premature infants cared for in the center. This includes service to the mother while she is in the hospital.

A medical social worker on the staff of the hospital gives service to the families living within the city and county of Denver. The medical social consultant on the staff of the Colorado State Department of Public Health serves families who live outside the Denver area.

Most of the babies not born in Colorado General Hospital but brought to the center are referred by a private physician. The services of the medical social worker and the public-health nurse are explained to this physician before they are offered to the family. Very few physicians or families have raised any questions regarding social services, perhaps because there has been such obvious need in the families of the infants who were referred to the center.

The medical social worker works closely with the doctors and nurses in the hospital well-baby clinic to which premature babies are brought. The babies discharged from the center are supervised here if they are not under the care of a private physician. The worker exchanges information with the doctors and nurses about the progress of the babies. Frequently the pediatrician consults the worker when a baby fails to make the progress the clinic had expected to see, or when he loses weight. The doctor asks the social worker if anything in the home conditions could account for the set-back and, if so, what can be done to help. She usually makes a home visit and discusses the situation with the pediatrician before the baby's next visit to the clinic.

A baby born at home, weighing 3 pounds and 13 ounces, was admitted to the center shortly after birth. She was the fifth child in a Spanish-American family that had been living on a marginal income for some years. The father was unemployed when the baby was born. He had just applied to the department of public welfare for help. The public welfare worker assigned to the family and the medical social worker discussed the family situation. The medical social worker had found that the assets in the home were strong family ties, good relations between all members of the family, and a genuine concern for the tiny new baby; the only liabilities were the lack of funds and the crowded conditions of the run-down place in which the family had to live. It was quite apparent that the mother would give the baby as good care as the home surroundings and family circumstances would permit her to give.

Because the family was to receive public assistance, the medical social worker's part was to interpret to the public welfare worker some of the problems in relation to the prematurity, and to talk over the situation with the public-health nurse who was to give nursing supervision at home. Meanwhile, the mother was to take the baby to the special well-baby clinic for follow-up care.

A while later, after a clinic pediatrician had seen the baby, he conferred with the medical social worker. The baby was not getting along satisfactorily, he reported. The medical social

worker found that the family was no longer receiving assistance because the father had returned to work, but his earnings were hardly enough even to feed the family.

The medical social worker talked with the father with the help of an interpreter. The father told the worker that he was worried about his health. He feared that he would not be able to work much longer to support his wife and children. The public welfare worker and the medical social worker arranged for a physical examination that revealed the father's acute need for medical attention. While he was receiving medical treatment the public welfare department gave financial help to the family, with knowledge that the family had a baby requiring special care from her mother because she was not making the progress anticipated.

This tiny girl progressed slowly. For that reason she was followed longer than 6 months, the usual time at the clinic, and a little over a year after her birth the pediatrician described her as a well baby. She was small, to be sure, but she was developing normally and was well-nourished. The doctor reported that there were no longer any physical problems, and it was agreed that the mother should now take the baby to the child-health conference in her neighborhood.

One of the services of the medical social consultant on the staff of the Colorado State Department of Public Health is to discuss with consultants in other programs of the department, as well as with local health and welfare agencies, the social and emotional problems related to the premature birth of a baby. These discussions have been useful in integrating the available services and in pointing out gaps in community resources for meeting the needs of these babies. Planning for a baby we might call Bobby brought out the need for developing further services for preschool blind children.

Bobby weighed only 1 pound 14 ounces when he was born at Colorado General Hospital. His mother was very attentive during the 5 months of his hospitalization at the center, but the father showed little interest in him. At first the mother was only able to bring out to the medical social consultant her concern over inadequate housing and finan-

cial problems. As she gained confidence in the consultant she was able to discuss her serious marital problems and her anxiety over her own insecurity with her family group.

The parents found it difficult to manage the care of four children and the marital tensions increased. The father started to drink heavily and the mother felt that she would have to seek employment to support the children. It seemed that the problems of this family were beyond the function of the medical social consultant of the health department and required intensive and continuing case-work service such as is offered through a family-welfare service. This community resource was interpreted and discussed with the mother. Through the continued case-work services of the medical social consultant, the family was able to make application to a suitable community agency.

Later the parents became concerned over the baby's inability to see and discussed this problem with the medical social consultant. Arrangements were made for full reexamination of the infant's eyes at Colorado General Hospital. A diagnosis of bilateral retrolental fibroplasia was made. The father expressed open hostility regarding the child's blindness and his attitude toward his wife indicated that he felt it was her fault. The father's reaction to the patient's eye condition intensified the marital difficulties and the parents separated.

Through the community agency, plans were made for temporary placement of the patient and his brothers in foster homes until adequate future plans could be worked out. Continued medical social interpretation of the patient and his need were made to this co-operating agency. Tentative plans are being made by the Colorado premature-infant-center staff to work with community agencies in developing services for such blind children of preschool age.

The medical social workers take part in certain aspects of the teaching program in the center for premature babies, in addition to the direct social case-work service and the consultant service that they give. They have taken part in the special courses for nurses and physicians by presenting case material as a means of bringing out the social, emo-

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# TO IMPROVE THE NURSING CARE OF THE PREMATURE BABY

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This premature baby is being fed by a nurse who has been specially trained in caring for such babies. Because he is too weak to suck, the nurse feeds him with a medicine dropper.

**A** PREMATURE baby's life may depend on whether or not the person who takes care of him has the knowledge and skill needed for the care of such infants. Unfortunately, there are not as yet enough professional workers with this special knowledge, and undoubtedly many premature babies die who might have been saved by better care.

New York City recently gathered some evidence pointing to this conclu-

sion, when the maternal and newborn division of the city department of health joined with the Kings County Medical Society in inquiring into the preparation of nurses who had cared for the 55 premature infants who had died during a specified month. Of the 135 nurses who had cared for these 55

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An address given before the Association of State and Territorial Health Officers, at Washington, D. C.

babies, only 1 had had any training in the care of prematures.

Seventy-seven of the one hundred and thirty-five nurses were graduate nurses (and it was one of these who did have the special training). Twenty-five were licensed practical nurses; 16 were non-licensed practical nurses; 8 were student nurses; 1 was a hospital attendant; 3 were student practical nurses; and the status of 5 nurses was unknown.

The impression that there are not enough nurses with special preparation in the care of premature babies is strengthened by observations made in the hospitals of New York City by the city health department's hospital consultation service, whose purpose is to improve the hospital care given to mothers and newborn infants, including prematures. This service sends survey teams to the various hospitals to observe the quality of care and make recommendations for improving it. Each team includes an obstetrician, a pediatrician, and a public-health nursing consultant.

These teams report that too many premature babies are improperly cared for because the members of the hospital staff simply do not know what should be done. Many of the nurses, incidentally, have told the survey teams that they realized how inadequate their training in the care of prematures had been, and that they would like to receive better preparation.

And, according to the pediatric members of the survey teams, it is not only the nurses who need further instruction in the care of premature babies, but also the doctors.

An ideal plan would seem to be for the nurse and the pediatrician who are responsible for the care of the premature babies in a hospital to be taught jointly, along with the public-health nurse who visits the babies in their homes and helps the mothers to care for their babies.

Joint training of this kind is now being given at the New York Hospital. Another hospital in New York City that offers preparation in the care of the newborn, including premature babies, is the Sloane Hospital for Women. This is a 4 weeks' work experience, but it is for nurses only.

It is well recognized that there is great value in learning about different programs. Therefore, many nurses from New York City go for training to hospitals and schools of nursing in various cities that offer special work with premature babies.

Courses in nursing care of premature babies are given in the following schools of nursing: University of Colorado, Denver; Louisiana State University School of Medicine, Division of Nurs-

ing Education, New Orleans, La.; and Los Angeles County General Hospital School of Nursing, Los Angeles, Calif.

Some hospitals that offer periods of supervised experience (not courses) in nursing care for premature infants are Margaret Hague Maternity Hospital, Jersey City, N. J.; Michael Reese Hospital, Chicago; Presbyterian Hospital, New York City; and the Johns Hopkins Hospital, Baltimore, Md.

In all these institutions opportunities for clinical instruction and experience in the care of the premature baby are open to both institutional and public-health nurses.

Here is a typical report by a nurse who had the opportunity to receive preparation in a hospital that gives good care to premature babies:

"Before I went for additional training, I had only the vaguest knowledge of how to care for a premature baby, for I had had only 2 weeks' experience in this field during my student days. I was actually afraid to handle such a baby. But at X hospital my whole attitude changed. I was amazed at the attention the nurses gave the babies at feeding time. At the hospital I came from, the nurse would prop up the baby's bottle and leave him to feed himself—even a premature baby! But in X hospital the nurse would sit in a chair and hold the baby while feeding him. She was not in a hurry; she cud-

dled the baby and talked to him (this was a large premature baby) and in the meantime she had a wonderful opportunity to observe him and see how he was reacting to feeding."

Another nurse's report:

"At Y Hospital I had an opportunity to observe the birth of a premature baby. I learned how to admit a baby to the premature-baby nursery and how to care for him there. I observed the procedure in the well-baby clinic for prematures. The head nurse's lectures and demonstrations were clear and useful. The doctors were cooperative and were always willing to answer our questions. The library was open to us during our free time. After I gained some experience in caring for premature babies I began to regard them in a new light."

One of the important gains that nurses have reported after experience in a hospital that gives especially good care to premature babies is a keener appreciation of the parent-child relationship and of the social and psychological problems involved in the care of a premature baby.

On the whole, we have found in New York City that providing opportunities for periods of instruction and experience in the care of premature babies for the hospital staff, and in-service educational programs, has been an important step toward saving the babies' lives.

When a premature baby is mature enough to be cared for outside of an incubator, the high-quality nurse holds him in her arms while she is giving him his bottle. She cuddles him and talks to him. And she has an opportunity to observe him and see how he reacts to feeding.



## LESSER

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### Publicity and general educational activities.

Most State health departments are carrying on one or more such activities. Some have programs which include virtually all of them.

A premature-baby program, to be comprehensive—

Should use first-rate facilities, staffed with well-trained personnel.

Should provide consultation services to hospitals.

Should include measures designed to prevent prematurity.

Should provide for the transportation of premature babies to the hospital.

Should be responsible for paying for hospitalization of premature infants.

Should take cognizance of the important role of the general practitioner and the obstetrician as well as the pediatrician in the program.

Should plan with the family for the infant's discharge from the hospital and follow-up.

### Full-term infants also benefit

Such a program not only works to save premature babies, but plays an important part in improving hospital nursery care for full-term infants throughout the State as well, since its influence has been found to extend beyond the special facilities for premature infants.

Measures to prevent premature labor and to provide expert care during labor when pregnancy is complicated are taking on an increased importance in these programs. The obstetric consultation clinics in Maryland and Colorado and the hospitalization of patients with complications of pregnancy in Maryland and Virginia are examples of such measures. At the same time it is recognized that there are still many women being delivered with inadequate prenatal care, and that provision must be made for good care through the extension of prenatal clinics.

A few studies of the costs of care of premature infants are becoming available. All show that such care is expensive.

The major item of expense is of course hospitalization, and since hospital care

is purchased by State health departments on a cost basis, the average cost will depend on the average daily cost rate per patient of the hospitals used in the program.

In the West Virginia program the average cost of care for 145 infants was \$341.70 per infant.

In the North Carolina program the average cost of care for 441 infants was \$411.48.

Such cost figures, though they help in planning the over-all budget for a program, do not reflect the wide range in costs for care of infants in different weight groups and do not give an adequate picture of the expenses faced by a family having a premature infant.

For example, in Colorado, there were 29 survivals among babies in the weight group 1,000 to 1,499 grams. The average cost of care for this group was \$827 per infant, but for 25 percent of the infants in the group the cost exceeded \$1,000. In the weight group 1,500 to 1,999 grams there were 53 infants. The average cost per infant was \$572.

For 81 infants weighing 2,000 to 2,499 grams, the average cost per infant was \$199.

About 50 percent of the Colorado infants required hospitalization costing \$400 or more each and of the families whose incomes were known 83 percent had less than \$400 per month. Social data on the first 175 patients in the Colorado program were submitted to a committee of the State medical society, which agreed that 174 of these families could not pay.

The West Virginia program includes on its application form items on family income and on number of dependents. After a review of the first year's operations, the maternal and child-health director stated that if the health department had assumed a fee-collecting role it would have been able to collect from only three families, and then no more than \$500. The expenditures for care during this period by the State health department amounted to about \$50,000.

### Premature babies create family problems

As may be expected with an unanticipated event such as the birth of a premature infant, difficulties in family adjustments to meet the situation are frequent and often serious. Although the most common problems in the Colo-

rado program were found to be inadequate finances and unsatisfactory housing, there were numerous other problems, such as maternal overanxiety, maternal rejection, neglect of other children, and family tensions. There were 38 unmarried mothers in the group. During a year the Colorado program provided some medical social services to 88 percent of the families, and 46 percent received continued case work after the baby was discharged from the hospital.

The studies of the State academies of pediatrics are providing a strong stimulus to the development of services for premature infants, since so many of them are recommending that health departments emphasize such services. Thirty-three State health departments reported to the Children's Bureau that they will develop or expand programs for premature infants if additional funds become available.

### Regional centers would help

The development of Nation-wide services for the care of premature infants would be accelerated by the establishment of several well-developed State premature-infant centers which could be used not only for service but also as regional training centers for hospital and health-department staffs, and for consultation to hospitals, to assist them in improving their full-term nursery practices as well as in developing special facilities for premature infants.

In addition to funds for such regional training centers, financial assistance is needed by State health departments to develop premature-infant programs.

It is evident that we need information on premature babies that is not usually obtained in basic research in physiology, anatomy, and pathology. Research could well be directed toward increasing our information regarding the best definition of premature infant, the incidence and distribution of premature birth, the causes of premature birth, the prevention of premature labor, nursery design, methods of care, influence of social and economic conditions on premature birth and on survival of premature infants, and costs of care. When we have learned much more about all these, we should be able to do a better job of saving premature babies.



## MARQUIS

(Continued from page 151)

may ask the family to make changes in home arrangements to make good care possible. She carefully examines all the brothers and sisters for contagious infection. She may call upon a social agency to help the family solve its problems. Finally, she makes a report to the hospital. No baby should be discharged from the hospital or the center until home conditions are satisfactory for his survival. The nurse makes another visit to the home just before the baby is discharged and reports to the hospital.

In West Virginia we have occasionally had to find foster homes for some of our babies (in collaboration with the department of public assistance). This part of the program is just as important as any other, and the public-health nurse should be instructed so that she appreciates her responsibility for assessing home conditions.

The nurse should return for a follow-up visit within 24 hours after the baby is discharged from the hospital, and she should continue these visits until both she and the mother consider them no longer necessary. It is wise for the baby to have a medical check-up 2 weeks after his discharge from the hospital, and at regular intervals thereafter. If no private medical care is available, the baby should be taken to a well-child conference.

The question is frequently raised whether premature babies are worth saving. The famous men of history who were prematurely born contributed greatly to our civilization. Sir Isaac Newton was an unusually small premature baby, but he grew in strength as he grew older and lived to be 85 years old. Charles Darwin was also extremely small at birth. He grew up to be a member of a 6-year geological survey, survived the hardships of a shipwreck while on a scientific expedition, and was one of the few members of the expedition able to hunt for food to keep them all alive. He lived to be 73. Napoleon was born prematurely, yet lived to be 51. Voltaire, the famous French writer, lived to be 84. Jean Jacques Rousseau and Victor Hugo are other famous Frenchmen born prematurely. A well-controlled study covering a 5-year period, conducted by Mohr and

Bartelme in connection with Dr. Hess' clinic at Michael Reese Hospital proved that at the end of 4 or 5 years no difference in physical development could be detected between the prematurely born and the full-term children. (J. H. Hess et al.: *Physical and Mental Growth of Prematurely Born Children*, U. of Chicago Press, 1934.)

Mental development also proceeds normally in the premature group, although it is sometimes slower than in full-term children. There is a higher incidence of hydrocephalus among babies born prematurely, but this condition occurs almost entirely in infants who suffer intracranial hemorrhages. Retrolental fibroplasia, a condition that causes blindness, is prevalent among premature babies who weigh under 1,500 grams. It is interesting to note that the incidence of this condition varies in different parts of the country.

The job of saving premature babies has just begun. We need to reach more of them. We need more centers, more personnel, more equipment. We should develop research projects that will teach us not only to understand the problem of premature infants but also how to prevent their being born prematurely. We need institutes so that people in the field can become accurately informed. We should train more personnel.

Though the excellent work of the American Academy of Pediatrics goes a long way toward throwing light into dark places, in many ways the medical profession needs a great deal of prodding. The Academy has published a manual, giving standards of care of newborn and of premature babies.

We need better reporting about work done and more accurate statistics. We should educate the public and the community to an appreciation of the whole problem. Hospital administrators should become enthusiastic proponents of our program because no part of a hospital creates more good will than its nursery for premature babies.

Every area should have access to a center for the care of premature babies, which in turn should serve as a teaching center and a research unit. The citizens of a community that has such a center can point to it with pride as a product of the true working of our form of government—democracy.

## GORDON

(Continued from page 154)

Furthermore, the information gathered by the public-health nurses and the social workers have permitted us to individualize our criteria for discharge. For example, of 81 infants in the 2,000 to 2,500 gram weight group, 40 were hospitalized for 7 or fewer days, and of these 40, 26 were discharged on breast, or breast plus bottle. For the smaller infants, too, the drive has been toward as early discharge as possible. Not only does this decrease the period of separation of mother and infant, but it conserves our limited space, our limited expert nursing service, our limited finances for those infants who cannot be cared for any other way. During the year of survey, a total of 4,718 hospital days of care was given to the 165 surviving infants. Forty-one percent of the total bed-days was devoted to care for infants, while they weighed less than 2,000 grams, whereas 59 percent of care was given to infants while they weighed more than 2,000 grams. Our attempt will be to reduce the latter figure, and success will come only if we can transfer the responsibility for this care to the mother in the home, with the aid of the public-health nurse.

A word about the ultimate development of prematurely born infants. The best follow-up data—that of Dr. Julius Hess and his group—indicate that if a congenital malformation or injury is not present at birth the prematurely born infant will develop into a normal child. Not even the very varying risk of retrolental fibroplasia can serve as consolation for death of a prematurely born infant. The Lord was willing to save Sodom and Gomorrah for a very small percentage of the population—the prognosis for goodness of premature infants is much, much better.

We have tried to outline some of the aims of the Colorado State Program for the care of premature infants. In the long run the most effective methods of reducing mortality and morbidity must depend on concerted efforts of private and public agencies, as well as of individuals, and the State health department would appear to be the proper agency to give leadership.

## COHIG AND MASON

(Continued from page 158)

social, and environmental problems related to premature birth.

In the courses for nurses the medical social worker has served as a member of a panel. For these panel discussions one case has usually been selected to show the care given to the premature infant during hospitalization and after his discharge from the hospital. The social worker's part in these discussions has been to emphasize the medical social aspects of the situation and to interpret the service she has given. The less formal part of the social worker's "teaching" takes place during her daily association with the other members of the staff of the center by focusing attention on the social aspects of the baby's care.

The hospital social worker in attending ward rounds takes an active part, with the doctors and nurses, in following the baby's progress and helping to plan for his care. The social record is part of the medical chart, and its information is useful to the medical staff in planning the patient's medical care, in research, and in teaching.

Both medical social workers—the consultant and the hospital social worker—have held regular case conferences with the public-health nurses about certain of the infants who have left the center. They exchange information about the progress of the baby in the light of the family situation in his home. Through these conferences the medical social workers have had an opportunity to bring out the medical social implications and to give guidance in the utilization of community agencies to meet the needs. A deeper understanding between nurses and social workers has been developed and the functions of each have been more clearly defined.

The families of premature infants cared for in the Colorado premature-infant-care program have presented a variety of medical social problems. Through the cooperation of the different staff members of the center and of public-health nurses, physicians, and community agencies, an effort has been made to offer a number of premature babies the best possible care within the resources of the family, the community, official health agencies, and the center.

## FOR YOUR BOOKSHELF

**MARY IRENE ATKINSON SPEAKING FOR CHILDREN.** Cheney C. Jones and Gertrude Springer, Editors. Parthenon Press, Nashville, Tenn., 1949. For sale at Methodist Book Store, 810 Broadway, Nashville, Tenn. 192 pp. \$2.50.

This book, from the frontispiece to "Mary Irene's Farewell," and all the pages in between, speaks to our minds and hearts of the vivid, generous, simple, yet profound personality of one of America's greatest friends of children. The sponsoring committee, and particularly the editors, have rendered a great service in bringing together the rich heritage found in the writings and speeches of one who played an important part in shaping trends in child-welfare work under both public and private auspices during the 25 years from 1918 to 1943.

The editors have done much more than assemble, select, and edit—they have woven the material together into a symmetrical whole, illustrative of major trends throughout this period, and the result is a book of compelling beauty, great compassion, homely wisdom, historical perspective, and philosophic insight.

Mary Irene's profession was social work, her specialty the welfare of children, her thought and action always bearing the stamp of a pioneer heritage and the relationships and happenings of a small midwestern town, yet she knew and was equally at home in every part of our country and in the thought and experience of past ages. Of her, Cheney Jones says, "She had come to know her United States. . . . She felt at home with any and all of us and talked a language we could all understand. The common people heard her gladly."

Children of the decades of the "twenties" and "thirties" badly needed a spokesman, and Mary Irene was a tireless pleader of their cause. Whether she was pleading for mattresses instead of iron slats in a children's institution, for china instead of enameled tableware, for some place where a child could keep his own things, or for development throughout the Nation of adequate organizational structure and administrative practices in child-welfare work, her motive was always the same—the ideal expressed in a quotation she used from Dr. James S. Plant—"Every child should be made to feel that he is a special blessing in the sight of the Lord."

Katharine F. Lenroot.

## CALENDAR

**May 1-3**—National Council of Juvenile Court Judges. Annual meeting. Pittsburgh, Pa.

**May 1-7**—National Correct Posture Week. Sponsored by National Chiropractic Association.

**May 5-6**—American Council on Education. Annual meeting. Chicago, Ill.

**May 7-12**—Biennial Nursing Convention. American Nurses' Association, National League of Nursing Education, and National Organization for Public Health Nursing. San Francisco, Calif.

**May 7-13**—National Hearing Week. Information: American Hearing Society, 817 Fourteenth Street NW., Washington 5, D. C.

**May 7-14**—National Family Week. Eighth annual observance. Sponsored by the Interfaith Committee on Family Life, representing Jews, Catholics, and Protestants. Information: Rev. Richard E. Lentz, International Council of Religious Education, 206 South Michigan Avenue, Chicago 4, Ill.

**From May 8**—Third World Health Assembly. Geneva, Switzerland.

**May 8-9**—Society for Pediatric Research. French Lick, Ind.

**May 8-10**—American Pediatric Society. French Lick, Ind.

**May 14-18**—Boys' Clubs of America. National conference. Washington, D. C.

**May 14-19**—International and Fourth American Congress on Obstetrics and Gynecology. New York, N. Y.

**May 16-20**—American Association on Mental Deficiency. Seventy-fourth annual meeting. Columbus, Ohio.

**May 22-24**—National Conference on Citizenship. Fifth annual meeting. Washington, D. C.

### Illustrations:

Cover and pages 149 and 159, Southern Educational Film Production Service, Athens, Ga.

Page 147, Stanton Singer for Children's Bureau.

Pages 147 and 151, Philip Bonn for Children's Bureau.

Page 155, courtesy of Dr. A. L. Carswell, Director, Bureau of Maternal and Health, Virginia State Department of Richmond.

**CHILD HEALTH DAY, 1950**  
**By the President of the United States of America**  
**A PROCLAMATION**

WHEREAS the people of our Nation, believing in the dignity and worth of every individual, feel particular concern for the health and welfare of our children; and

WHEREAS our national aim is to assure to every child the chance to develop those physical, spiritual, emotional and mental qualities that make for individual happiness and responsible citizenship; and

WHEREAS we are dedicated to the achievement of that ambition, through democratic processes, for all our children; and

WHEREAS the great advances in knowledge and practice made in the last half century in assuring better health and security to our children have benefited great numbers but have not yet reached all; and

WHEREAS we propose to examine our achievements and our shortcomings in regard to child care at the Midcentury White House Conference on Children and Youth, to be held in December 1950, and to arrive at the greatest possible agreement on how we can demonstrate our determination to give every child the best possible start in life; and

WHEREAS the Congress, by a joint resolution of May 18, 1928 (45 Stat. 617), authorized and requested the President of the United States to issue annually a proclamation setting apart May 1 as Child Health Day:

NOW, THEREFORE, I, HARRY S. TRUMAN, President of the United States of America, do hereby designate May 1, 1950, as Child Health Day and I urge all citizens, individually and in their community, State, and national preparations for the Midcentury White House Conference on Children and Youth, to consider on that day the needs of children in their own communities and States and the best ways of meeting those needs.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

DONE at the City of Washington this nineteenth day of April in the year of our Lord nineteen hundred and fifty, and of the Independence of the United States of America the one hundred and seventy-fourth.



*Harry Truman*

By the President:

*Dean Acheson*  
 Secretary of State

VOL. 14, No. 10

APRIL 1950

# the CHILD

published monthly by the  
 Division of Reports  
 CHILDREN'S BUREAU

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THE CHILD, monthly bulletin, was authorized by the Bureau of the Budget, May 12, 1936, to meet the needs of agencies working with or for children. The Children's Bureau rarely assume responsibility for statements or opinions of contributors not connected with the Bureau. THE CHILD is for sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at \$1 a year. Single copies 10 cents.



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